

Senescence and targeted senolysis

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Cellular senescence is a stress response mechanism activated upon a variety of stimuli, external or internal to the cell. On a transient basis, senescence preserves homeostasis, as it facilitates removal of damaged and/or dysfunctional cells by the immune system. However, if senescent cells are not promptly removed, they can accumulate in tissues and organs over time, fostering aging and the development of various age-related disorders, including cancer. The field of senolytics, dealing with drugs that eliminate these cells in order to alleviate their adverse effects (senolysis), has been rapidly expanding in the last two decades. Yet, currently available senolytics are repurposed drugs that exhibit significant undesirable side-effects. Capitalizing on a unique feature of senescent cells that we identified, namely the accumulation of lipofuscin (dark matter), we developed an innovative senolytic platform for targeted senolysis with minimal systemic toxicity.